PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

IBARAKI et al

Group Art Unit: Not yet assigned

Serial No.: New Application

Examiner: Not yet assigned

Filed: November 13, 2001

Attorney Dkt. No.: 107292-00030

For: METHOD AND DEVICE FOR WORKING PLANNING, AND METHOD AND DEVICE FOR PRODUCING WORKING DATA THEREFOR

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

November 13, 2001

Sir:

Prior to calculation of the filing fees and initial examination of the application, please amend the above-identified application as follows:

IN THE CLAIMS:

Please amend claims 7, 11-13, 24, 28, 30, 38, 40, 43-46, 61-62, 64-65, and 67-69 as follows. A copy of the marked up original claims is attached to this response showing the changes as set forth in amended 37 CFR 1.121.

7. (Amended) The working planning method according to claim 5, wherein said first and second directions are set to correspond to the moving direction of a workpiece.

11. (Amended) The working planning method according to claim 10, wherein said area placement is provisionally determined by a method comprising the steps of:

provisionally setting a next working area so as to enclose an end point in a first direction not yet enclosed by the working area;

moving said provisionally set working area in a second direction different from said first direction to enclose an end point in the second direction;

again moving said moved working area in the first direction so as to enclose the end point in said first direction in positions after the movement; and

again moving the re-moved working area in the second direction so as to enclose the end point in said second direction in positions after the re-movement, wherein

said steps of moving are repeated to define the next working area.

12. (Amended) The working planning method according to claim 10, wherein said area placement is provisionally determined by a method comprising the steps of:

simply dividing an entire surface of the workpiece into the working areas; and

subsequently removing all the working areas without any working position.

13. (Amended) The working planning method according to claim 10, wherein said area placement is provisionally determined by a method comprising the step of:

repeating the step of placing a working area in a position with a largest number of working positions not yet enclosed until all the working positions are enclosed.

24. (Amended) The working planning method according to claim 22, further comprising the steps of:

setting the interval of said working units;

overlapping scanning or moving ranges of the working units at that time, thereby obtaining area placement to minimize number of working areas; and

calculating the number of scanning or moving of the working means and the number of moving the stage at the time.

28. (Amended) The working planning method according to claim 26, wherein said tree is used to list point data in each working area after the position of working areas scattered on the workpiece is determined.

30. (Amended) The working planning method according to claim 26, wherein process of searching nearest neighbor point to a point of interest is conducted using said tree.

38. (Amended) The working planning method according to claim 36, wherein the process of removing a found point from said tree is performed by reducing ending number of an index attached to each point data or by increasing starting number.

40. (Amended) A working planning method, wherein a working path determined by a working planning method according to claim 37 is set as an initial solution in determining order of working by applying a traveling salesman problem.

43. (Amended) The working planning method according to claim 26, wherein

in the process of enclosing point data in the working area with the minimum number of equal size rectangles,

every time a provisional working area is produced by calling a loop, said tree is built both for the provisional working area and provisional point position data in each working area.

44. (Amended) The working planning method according to claim 26, wherein said tree is built both for the working area and point position data in each working area when the working area is defined.

45. (Amended) A working method performing working determined by the working planning method according to claim 1.

46. (Amended) A computer program for implementing the working planning method according to claim 1.

61. (Amended) A working device comprising the working planning device according to claim 47.

62. (Amended) A computer program for implementing the working planning device according to claim 47.

64. (Amended) The working data producing method according to claim 63, wherein

said working plan is determined by a method comprising the steps of:

determining an optimal working path for working positions in each working area; and

subsequently determining order of working at the working positions in each working area so that the total working time is minimized in the working areas to be simultaneously worked.

65. (Amended) A computer program for implementing the working data producing method according to claim 63.

67. (Amended) The working data producing device according to claim 66, wherein

said working plan is determined by a method comprising the steps of:

determining an optimal working path for working positions in each working area; and

subsequently determining order of working at the working positions in each working area so that the total working time is minimized in the working areas to be simultaneously worked.

68. (Amended) A computer program for implementing the working data producing device according to claim 66.

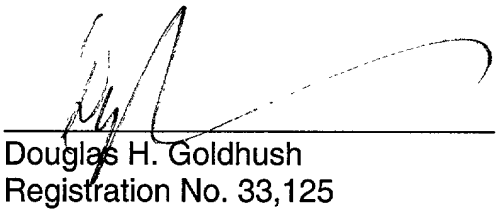
69. (Amended) A computer readable recording medium recorded with the computer program according to claim 46.

REMARKS

Claims 1-69 are pending in this application. By this Amendment, claims 7, 11-13, 24, 28, 30, 38, 40, 43-46, 61-62, 64-65, and 67-69 are amended to correct the multiple dependencies thereof and to place this application into better condition for examination. No new matter has been added.

In the event that there are any fees due with respect to the filing of this paper, please charge Deposit Account No. 01-2300.

Respectfully submitted,



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Enclosures: Marked-up Copy of Amended Claims

MARKED-UP COPY OF AMENDED CLAIMS
ATTY. DOCKET NO. 107292-00030

7. (Amended) The working planning method according to claim 5 [or 6], wherein said first and second directions are set to correspond to the moving direction of a workpiece.

11. (Amended) The working planning method according to claim 10, wherein said area placement is provisionally determined by [the method according to claim 5] a method comprising the steps of:

provisionally setting a next working area so as to enclose an end point in a first direction not yet enclosed by the working area;

moving said provisionally set working area in a second direction different from said first direction to enclose an end point in the second direction;

again moving said moved working area in the first direction so as to enclose the end point in said first direction in positions after the movement; and

again moving the re-moved working area in the second direction so as to enclose the end point in said second direction in positions after the re-movement, wherein

said steps of moving are repeated to define the next working area.

12. (Amended) The working planning method according to claim 10, wherein said area placement is provisionally determined by [the method according to claim 8] a method comprising the steps of:

simply dividing an entire surface of the workpiece into the working areas; and

subsequently removing all the working areas without any working position.

13. (Amended) The working planning method according to claim 10, wherein said area placement is provisionally determined by [the method according to claim 9] a method comprising the step of:

repeating the step of placing a working area in a position with a largest number of working positions not yet enclosed until all the working positions are enclosed.

24. (Amended) The working planning method according to claim 22 [or 25], further comprising the steps of:

setting the interval of said working units;

overlapping scanning or moving ranges of the working units at that time, thereby obtaining area placement to minimize number of working areas; and

calculating the number of scanning or moving of the working means and the number of moving the stage at the time.

28. (Amended) The working planning method according to claim 26 [or 27], wherein said tree is used to list point data in each working area after the position of working areas scattered on the workpiece is determined.

30. (Amended) The working planning method according to claim 26 [or 27], wherein process of searching nearest neighbor point to a point of interest is conducted using said tree.

38. (Amended) The working planning method according to claim 36 [or 37], wherein the process of removing a found point from said tree is performed by reducing ending number of an index attached to each point data or by increasing starting number.

40. (Amended) A working planning method, wherein a working path determined by a working planning method according to [any one of claims 37 to 39] claim 37 is set as an initial solution in determining order of working by applying a traveling salesman problem.

43. (Amended) The working planning method according to claim 26 [or 27], wherein

in the process of enclosing point data in the working area with the minimum number of equal size rectangles,

every time a provisional working area is produced by calling a loop, said tree is built both for the provisional working area and provisional point position data in each working area.

44. (Amended) The working planning method according to claim 26 [or 27], wherein said tree is built both for the working area and point position data in each working area when the working area is defined.

45. (Amended) A working method performing working determined by the working planning method according to [any one of claims 1 to 44] claim 1.

46. (Amended) A computer program for implementing the working planning method according to [any one of claims 1 to 44] claim 1.

61. (Amended) A working device comprising the working planning device according to [any one of claims 47 to 60] claim 47.

62. (Amended) A computer program for implementing the working planning device according to [any one of claims 47 to 60] claim 47.

64. (Amended) The working data producing method according to claim 63, wherein

said working plan is determined by [the method according to any one of claims 1 to 44] a method comprising the steps of:

determining an optimal working path for working positions in each working area; and

subsequently determining order of working at the working positions in each working area so that the total working time is minimized in the working areas to be simultaneously worked.

65. (Amended) A computer program for implementing the working data producing method according to claim 63 [or 64].

67. (Amended) The working data producing device according to claim 66, wherein

said working plan is determined by [the method according to any one of claims 1 to 44] a method comprising the steps of:

determining an optimal working path for working positions in each working area; and

subsequently determining order of working at the working positions in each working area so that the total working time is minimized in the working areas to be simultaneously worked.

68. (Amended) A computer program for implementing the working data producing device according to claim 66 [or 67].

69. (Amended) A computer readable recording medium recorded with the computer program according to [any one of claims 46, 62, 65 and 68] claim 46.